

U.S. Patent Application No. 10/691,186
Response to Notice of Non-Compliant Amendment and Corrected Amendment
and Reply dated December 26, 2006
In Response to Notice of Non-Compliant Amendment Dated December 18, 2006

REMARKS

Claims 219-257 remain herein and new claims 258 and 259 are added hereby. Thus, claims 219-259 are pending in this application.

The Examiner is thanked for indicating that claims 223-230 and 243-250, would be allowable if rewritten in independent form, including all of the limitations of the base claim and any intervening claims.

In view of the remarks set forth herein, further and favorable consideration is respectfully requested.

I. In item 5 of page 3, of the final Office Action, claims 219-222, 231-242, and 253-257, have been rejected under 35 USC §103(a) as being unpatentable over Dean et al. (WO 89/09437) in view of Van Nostrand. The Examiner states that Dean et al. is silent as to the specific algorithm employed to predict the sample temperature based on the block temperature. The Examiner asserts that Van Nostrand discloses a conventional algorithm (Newton's Law of Cooling) used to predict the temperature of a body as a function of time based on the temperature of the surrounding medium. The Examiner further asserts that Van Nostrand discloses that the use of numerical integration is known in the art to solve a differential equation when initial values are known. The Examiner concludes that it would be obvious to the skilled artisan to implore the temperature function of Van Nostrand to predict the temperature of the sample of the reference of Dean et al. for the known and expected result of imploring an art recognized differential equation and numerical integration to predict the temperature of a body relative to the known temperature of another body which was required of the algorithm discussed in Dean et al.

In view of the marks set forth herein, this rejection is respectfully traversed.

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Applicants note that during the prosecution of related United States Patent Application Serial No. 07/871,264, now U.S. Patent No. 5,475,610, in an Office Action dated August 23, 1993, claims 1, 128, 132, and 156, were rejected under 35 U.S.C. §102(b) as being anticipated by Dean et al. (WO 89/08437). In the August 23, 1993, Office Action, Examiner Teska asserted that Dean et al. teaches the invention as claimed. Responsive to the August 23, 1993, Office Action, Applicants filed an amendment dated February 23, 1994. In the Amendment dated February 23, 1994, Applicants amended claim 1 to include the limitations of claim 2. That is, in the February 23, 1994, amendment, Applicants amended claim 1 to describe that the temperature of a liquid sample mixture is determined as a function of the temperature of the sample block utilizing the formulaic relationship recited in the claim. Applicants stated that this formulaic relationship or concept simply does not appear to be disclosed or suggested in Dean et al.

A Final Office Action in U.S. Patent Application No. 07/871,264 was issued dated May 13, 1994. In the May 13, 1994, Final Office Action, in Item 8, on page 12, the Examiner stated that the rejection of the claims based on prior art (102 and 103) was thereby withdrawn since none of the prior art taught the equation claimed. The same equation appears in the presently rejected claims. Applicants filed an amendment in U.S. Patent Application No. 07/871,264 on November 14, 1994, traversing other rejections. Thereafter, a Notice of Allowance dated May 1, 1995, was issued. The application then issued as United States Patent No. 5,475,610.

Applicants note that full faith and credit should be given to the search and action of a previous Examiner unless there is clear error in the previous action. In general, an Examiner should not take an entirely new approach or attempt to re-orient the point of view of a previous Examiner, or make a new search in the mere hope of finding something. Please see *Amgen Inc v. Hoechst*

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Marian Roussel, Inc., 126 F. Supp. 2D 69, 139, 57 USPQ 2d 1449, 1499-50 (D. Mass. 2001). See also MPEP Sections 704.10 and 706.04.

Consistent with Applicant's previous position, it is submitted that claims 219-221, 231-242, 253-257, are not *prima facie* obvious over Dean et al. in view of Van Nostrand. *Prima facie* obviousness requires motivation to make the proposed modification as well as a reasonable expectation of success. In the present case, neither Dean et al. nor Van Nostrand provide motivation to modify Dean et al. to include a numerical integration of Newton's Law of Cooling, let alone the particular aspects of Newton's Law of Cooling as taught by Van Nostrand.

Van Nostrand, at page 1116, states that Newton concluded that over moderate temperature ranges, the rate of cooling is proportional to the difference between the temperature of the cooling body and that of the surrounding medium, and that this may be expressed as a differential equation. Page 620 of Van Nostrand describes Euler's Method for Numerical Solution of a Differential Equation. This passage describes that the method described is actually a modification of that proposed by Euler and that both it and the original Euler method are slow in converging and give results of low accuracy. This passage concludes with the statement that while they are suitable for starting the solution of a differential equation, more accurate methods are preferred for continuing the solution. In view of Van Nostrand's teaching that Euler's Method of Numerical Integration for solving a differential equation gives results of low accuracy, a skilled artisan, in view of Nostrand, would have no motivation to utilize Euler's method or Euler's algorithm. In conclusion, it is submitted that neither Dean et al., nor Van Nostrand provide any motivation to modify Dean et al. by employing the algorithm and method disclosed in Van Nostrand. Further, it is submitted that, even assuming *arguendo* that motivation does exist, neither Dean et al. nor Van Nostrand provide a reasonable expectation of success. There is no reasonable expectation of success, because Van

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Nostrand states that both the original Euler method and the disclosed method for solving a differential equation, give results, that are slow in converging, and are of low accuracy.

It is submitted that nothing in Dean et al and Van Nostrand, render the invention of claims 219-222, 231-242, and 253-257, obvious within the meaning of 35 U.S.C. §103(a). Each of claims 220-222, 231-238 are directly or indirectly dependent on independent claim 219. As to claim 219, as acknowledged by the Examiner, Dean et al. is silent as to the specific algorithm employed to predict the sample temperature. Newton's law of cooling states that the rate of cooling is proportional to the difference between the temperature of the cooling body and that of the surrounding medium, over moderate temperature ranges. Claim 219 recites a computing apparatus comprising a program adapted to determine the temperature of a liquid sample mixture as a function of the temperature of the sample block over time, utilizing the claimed formulaic relationship. In the claimed formulaic relationship:

$$T_{\text{samp}_n} = T_{\text{samp}_{n-1}} + (TB_n - TSAMP_{n-1}) * \text{tinterval}/\tau$$

T_{samp_n} is equal to the sample temperature in a first sample interval, $T_{\text{samp}_{n-1}}$ is a sample temperature in a second sample interval immediately proceeding the first sample interval, the second sample interval designated as time $n-1$, TB_n is equal to the block temperature in the first sample interval, $\text{tinterval}/\tau$, is a time in seconds between consecutive sample intervals and τ is a function of thermal characteristics of the claimed apparatus, which comprises a heating and cooling system, a sample block, means for determining the temperature of the sample block and a computing apparatus.

Dean et al. fails to teach or suggest the claimed formulaic relationship including the terms of the formula. Dean et al. further fails to teach or suggest determining the temperature of a liquid sample mixture. The combination of Dean et al. and Van Nostrand also fails to teach or suggest a

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sample temperature in the first sample interval or sample temperature in a second sample interval immediately proceeding the first sample interval. The combination of Dean et al. and Van Nostrand also fails to teach or suggest the constant τ , which is a function of the thermal characteristics of the apparatus.

Regarding claim 220, the combination of Dean et al. and Van Nostrand, does not teach or suggest the formulaic term, τ , comprising a first thermal time constant corresponding to at least one sample tube and a volume of a sample mixture, and a second thermal time constant, corresponding to a block temperature sensor thermally coupled to the block, where τ equals approximately the first thermal time constant minus the second thermal time constant. With respect to claim 229, the Examiner states that one with ordinary skill in the art would recognize that the time constant is based on the size and material properties of the sample and block components. Again, there is nothing in Dean et al., Van Nostrand, or the combination of the two that teaches or suggests the first thermal time constant and the claimed second thermal time constant where τ equals approximately the first thermal time constant minus the second thermal time constant. It is respectfully submitted that the Examiner is impermissibly using hindsight consideration to arrive at this conclusion.

Claim 239 includes the same formulaic relationship featured in claim 219, and should be considered non-obvious for the reasons set forth above with regard to claim 219. Claim 240 includes the same formulaic term τ featured in claim 220, and should also be considered non-obvious for at least the reasons set forth above with regard to the allowability of claim 220. Claims 241-257 depend on claim 239 and should be allowable for at least the same reasons that claim 239 is allowable.

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In view of the foregoing, it is submitted that claims 219-222, 231-242, and 253-257, are non-obvious over the combination of Dean et al. and Van Nostrand, within the meaning of 35 U.S.C. §103. Accordingly, the Examiner is respectfully requested to withdraw this rejection.

New claims 258 and 259 are dependent on claims 219 and 239, respectively, and should be allowable for at least the same reasons that claims 219 and 239 are allowable. New claims 258 and 259 relate to an apparatus wherein tinterval, in the relationship to be utilized by the computing apparatus, equals approximately 0.2 seconds. Support for new claims 258 and 259 can be found, for example, in at least claim 61 of related U.S. Patent No. 5,475,610, and on or around page 131 of the present specification.

Conclusion

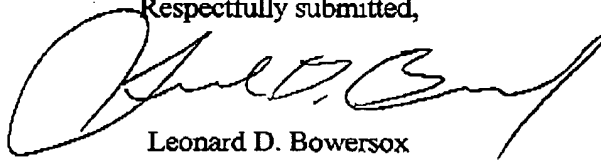
Applicants respectfully request favorable consideration of the present application and a timely allowance of the pending claims.

Should the Examiner deem that any further action by applicants or applicants' undersigned representative is desirable and/or necessary, the Examiner is invited to telephone the undersigned at the number set-forth below.

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If there are any other fees due in connection with the filing of this response, please charge such fees to Deposit Account No. 50-0925. If a fee is required for an extension of time not accounted for above, such extension is requested and should also be charged to said deposit account.

Respectfully submitted,



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